

What is Claimed is:

1. A method for fabricating arbitrary profiles comprising:  
creating a mask with a plurality of holes,  
providing a material having different transmission coefficient than the substrate and  
sufficient optical density range, onto the substrate through the holes of the mask.

2. The method of claim 1 wherein said creating of the mask comprises  
depositing a coating on a polished substrate,  
patterning that coating, and  
removing a section or all of the substrate.

3. The method of claim 2 wherein the polished substrate is silicon.

4. The method of claim 2 wherein the deposited coating is silicon nitride.

5. The method of claim 2 wherein said patterning includes photolithographic  
processes.

6. The method of claim 2 wherein said patterning includes laser ablation.

7. The method of claim 2 said removing includes etching.

8. The method of claim 7 wherein said etching includes using potassium hydroxide.

9. The method of claim 1, wherein said mounting includes providing a mask substrate  
between the mask and the substrate.

10. The method of claim 1, wherein said mounting includes providing a machined metal spacer between the mask and the substrate.

5 11. The method of claim 1, wherein the substrate is fused silica.

12. The method of claim 1, wherein said providing includes evaporating a metal.

10 13. The method of claim 1, further comprising, after said providing, fabricating a plurality of lenses on the substrate.

14. The method of claim 1, further comprising, before said providing, fabricating a plurality of lenses on the substrate.

15 15. The method of claim 1, wherein the substrate is reflective and the material is more absorbing than the substrate.

16. The method of claim 1, wherein the substrate is transmissive and the material is more reflective than the substrate.

20

17. The method of claim 1, further comprising spacing the mask from the substrate before said providing.

25 18. The method of claim 1, further comprising providing a phase controlling surface on the substrate.

19. A device comprising an array of apodized apertures on a substrate.

20. The device of claim 18, wherein the array of apodized apertures are combined with a corresponding array of lenses.

5

21. The device of claim 18, wherein the apodized apertures are on a fused silica substrate.

22. The device of claim 18, wherein the apodized apertures include a super-gaussian  
10 function.

23. An element comprising a first portion controlling a phase of light incident thereon and a second portion on the first portion, having a different transmission coefficient than the first portion, the second portion controlling an irradiance of light incident thereon.

15

24. The element of claim 23, wherein the second portion is directly on the first portion.

25. The element of claim 23, wherein the second portion is opposite a first portion on  
20 a substrate.